From U. S. Soil Erosion Service

Temple Ex. News Letter No. 2.

"Curley"

DECLINING CROP YIELDS

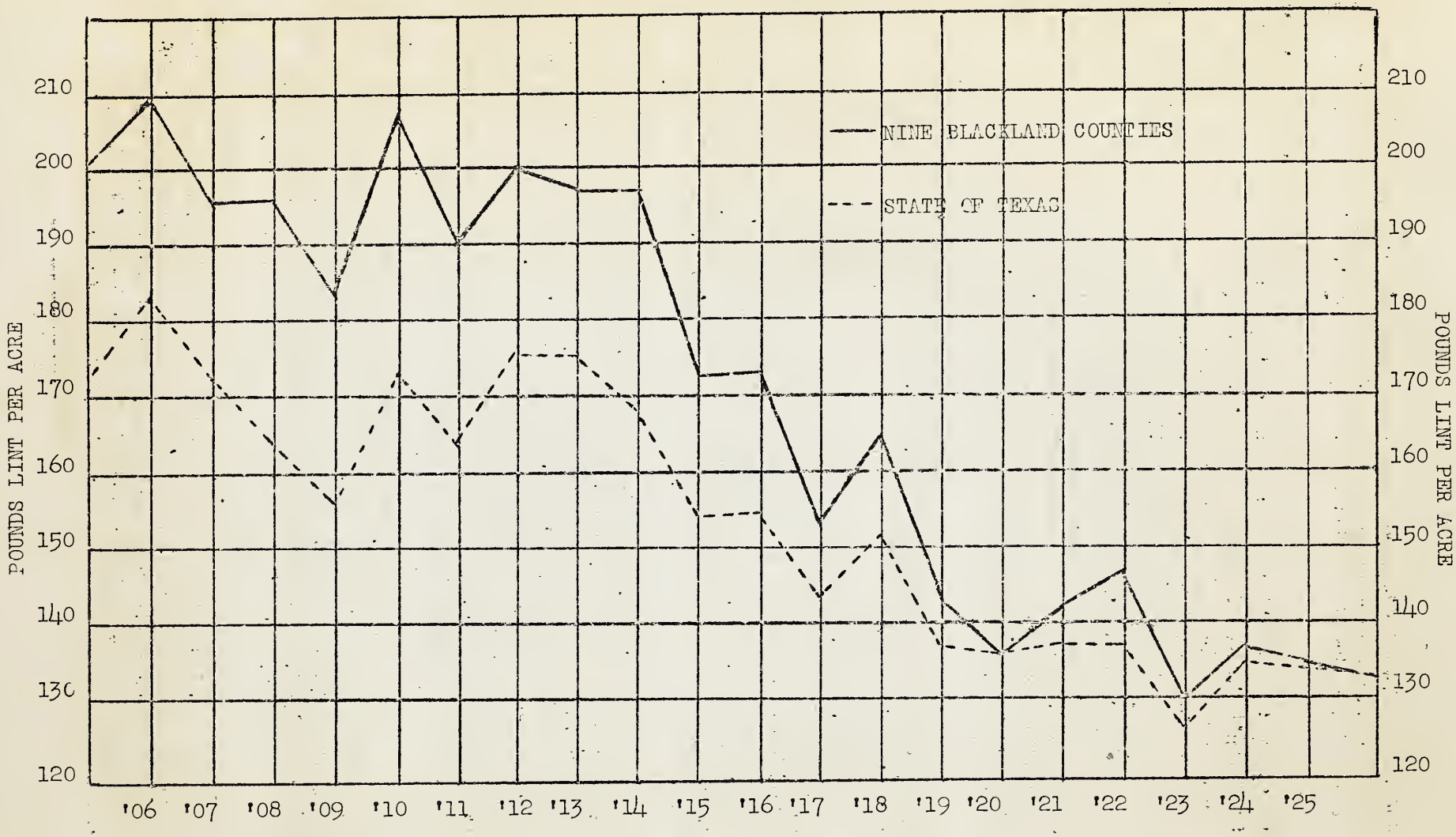
-- Henry Dunlavy
Superintendent,
Texas Agricultural Experiment Station,
Substation Number 5,
Temple, Texas.

The chart on the following page graphically shows the downward trend of acre yield of cotton in the Blackland region of Texas, and for the State as a whole. By studying the chart, it can readily be seen that the acre production of cotton in the Blackland region is declining more rapidly than in the State as a whole. For the first ten years, (1905-1914) acre yields in the Blackland region were 16.5 per cent higher than for the State as a whole, whereas, for the last ten years indicated on the chart, (1917-1926) the Blackland region yielded only 3.6 per cent more than the State as a whole. During the decade, acre production of cotton in Texas decreased 19.4 per cent, while in the Blackland region, the decrease was 28 per cent. The picture of the loss in acre production indicated by this chart is perhaps more nearly accurate for the Blackland region than it is for the State. This is due to the fact that during the period covered considerable new land has been put into production of cotton in the State, and this new land doubtless has a higher acreage production than land which has been in cultivation for some time. On the other hand, the Blackland region has had very little new land put into cultivation during this period and the trend, indicated on the chart, undoubtedly is a true picture of the declining productivity of the region.

The decline in yield of cotton in the Blackland region is principally due to the fact that a great deal of the fertility of the soil in this section has been removed by erosion. Perhaps the principal limiting factors for cotton production in the Blackland region are root rot and erosion. While there are few accurate records available as far back as the accompanying chart extends, observations indicate that root rot was plentiful and exerted a limiting influence on the production of cotton at that time. All records, however, indicate and observations by thousands of close observers confirm the fact that the results of erosion are much more noticeable now than they were twenty years ago. There are now large bodies of land in Bell, and other Blackland counties which are practically useless from an agricultural standpoint, and which are reported to have been making excellent yields of all crops twenty years ago. In a single season, all close observers have seen relatively large bodies of land forced out of cultivation, due to the excavation of large ditches by run-off water from the fields. These same observers have also noticed over a period of years that much of the Blackland region is getting lighter in color, due to the fact that the black and fertile top soil is gradually being washed away by sheet erosion, leaving the lighter subsoil to be farmed. Subsoil produces poor crops.

The present soil saving campaign is at least twenty years late for the Blackland region, as a whole. However, the fact that it is late cannot be remedied. The thing to be kept in mind is that further soil erosion MUST be checked, first, to prevent further deterioration of productive land, and second, to enable the rebuilding of land which has been taken out of profitable production, on account of erosion.

TREND OF COTTON ACRE PRODUCTION



FARM RECORDS.

Farming, like any other enterprise, requires some knowledge of ordinary business principles. Commercial firms that continue to meet the keen competition of today--firms that succeed in their undertakings from the start are found to use a good system of bookkeeping. Administrative heads of these firms must know which departments of the business have shown a profit and which have incurred a loss during the year's work.

Many farmers, unconsciously perhaps with some, practice the same plan in a less intensive manner through the use of "mental bookkeeping". Each year farmers tend to plan their programs on the basis of results obtained in the previous season--with whatever adjustments their sense of judgment can best direct in the light of outlook information available.

It is believed that farm operators could profit materially by the use of a simple yet complete farm record. Such records should enable the millions of farmers who are in a position to farm according to their best judgment to reach the most economically sound decisions after making a careful study of their past season's operations. Definite facts recorded should prove more reliable than one's mental record. Many farmers recognize the value of keeping farm records for the purpose mentioned above, and also to simplify the task of furnishing accurate yield and acreage information to the government under the Agricultural Adjustment program recently inaugrated.

Some pioneer farmers of this section have kept detailed farm records since back in the '80's and '90's. A record furnished the Soil Erosion Service by Mr. Frank Griffin of Yarrellton was kept by his father, A.J. Griffin, late farmer of Milam County. Mr. Griffin's books show farm cost accounts and weather records of 1876 and 1877, and a more complete cotton yield record from 1900 to 1919. He kept very detailed information on the weather conditions and his daily work up until within a few weeks of his death in March, 1928.

Another outstanding record found recently is that kept by Mr. R.E. Watson, near Heidenheimer in Bell County. Mr. Watson has a very complete record on farm expenses and sales since 1896.

From a personal interview with Mr. Watson it was learned that he moved to Texas from Tallapoosa County, Alabama in the fall of 1883, and settled near Midway, between Temple and Belton. He moved to his 104 acre farm south of Heidenheimer in 1897, buying the moderately improved tract for $37.50 an acre. This price was considered very high even for the best farm lands at that time. "It took me 12 years to pay for this place", explained Mr. Watson, "because of the very low price of cotton for the period during the Spanish-American War". Mr. Watson's record shows that he sold practically all of the cotton grown on his farm in 1897 for an average price of $1.60 per 100 pounds in the seed. The average price per pound received during the next five years for lint cotton has been taken from his record. He received in 1898, 4.5 cents; 1899, 6.8 cents; 1900, 8.4 cents; 1901, 7.9 cents; 1902, 7.2 cents; 1903, 9.8 cents; 1904, 7.8 cents.

The record kept by Mr. Watson indicates that he began raising mule colts on his farm and by 1905 kept two brood mares which were foaling 2 colts during each 13 to 14 month period. Mules were produced for setting up farms

of his two sons and the surplus colts were sold off. The present workstock on his farm were all raised, although the older ones are about twenty years old and the youngest one thirteen. The breeding was continued until about 1920, and Mr. Watson gave as his reason for discontinuing the practice his inability to handle and train the colts himself, stating that hired help was unsatisfactory for this purpose.

Another profitable side line found on the Watson farm is that of commercial honey production. The fine quality product sold by him has become known throughout Central Texas and is sought by wholesale grocers and chain stores over a wide area.

Mr. Watson related an interesting story about mailing a half-gallon container of honey to Washington which found its way to the President's table. Attesting to the fact that bee-keeping is a profitable enterprise on this farm is the record of honey sales for two years, 1909 and 1911, totaling $336.85, an average of $14.00 per month. By 1926 Mr. Watson had built a large apiary and the cash sales for the year totaled $674.28, or $56.20 per month.

The Soil Erosion Service is anxious to aid a number of farmers in the Elm Creek Watershed in keeping complete records of their farm operations, beginning January 1,1935. Simple record books are to be furnished and supervision of the actual record keeping given the cooperating farmers at regular intervals. The data secured are to be used in studying the effect of erosion control measures on the yields and incomes on typical farms of the area. Many farmers have expressed their desire to have these books furnished them at the time we secured the survey on their 1933 farming operations. Plans are being made to see all of these farmers before January 1st. Any others who wish to secure one of these record books should communicate at once with Mr. V.W. Woodman of the Soil Erosion Office, Temple, Texas.

PERMANENT PASTURES

A good permanent pasture is essential to economic feeding of all livestock. It is the cheapest feed you can produce. The animals harvest it themselves. It requires no cultivation, but does require some attention.

Pastures should not be overstocked. The Soil Erosion Service expects the cooperators who are receiving seed to not overgraze their pastures. To avoid overgrazing the permanent pasture should be supplemented by temporary pastures. The pasture should be mowed to keep down weeds. Mowing two or three times a year for three years will just about eliminate the weeds. Sheep and goats will clean a pasture of weeds.

Bermuda, or Buffalo, should be the basic grass for all permanent pastures. Dallis grass may prove a good basic grass under some conditions. Rescue, Italian Rye, and Black Medic or Bur Clover should be the winter grasses to supplement the basic grass. The above grasses will make, under normal conditions, good grazing for ten months out of the year. Contour furrowing of all pastures that are on rolling land is important and essential to hold sufficient water on the land to insure maximum growth of the grass.

Preparation of Land

Clean off underbrush in wooded sections and most of trees, leaving only best trees for shade. Blood weeds, tumble weeds, etc. should also be disposed of.

A firm seed bed is essential in seeding pasture grasses and legumes. If the land is baked or has a dense sod so that the seed cannot come in contact with the soil it should be run over with a disk harrow. Deep plowing will do more harm than good unless it is done several months before sowing time. Land that has been taken out of cultivation and is to be seeded to pasture grasses is probably in fair shape for seeding unless all top soil is gone. The land in this case would probably need disking and in some cases fertilizer should be used. Rolling or dragging the land after seeding to insure a firm seed bed is important. A roller can be made by placing two iron barrels end to end with rod through center and filling with concrete. A length of bridge timber drug over the land will help but will not pack the land as well as a roller.

Planting the Seed

The seed may be drilled in or sowed broadcast. Pasture seed are usually sown broadcast. Care should be taken not to cover small grain seed over $\frac{1}{2}$ inch deep. Spreading barnyard manure on the land before drilling or sowing is an excellent practice, or the seed may be mixed with manure and set out in piles. Five to ten lbs. of the heavy seed should be mixed with a wagonload of manure. Seed with burs, such as bur clover, should be mixed at the rate of one to two bushels to the load. In planting, one shovelful is thrown out every 6 to 8 feet without scattering.

WINTER LEGUMES AND GRASSES

Bur Clover

Bur Clover is one of the best winter and early spring plants for permanent pastures. It will sometimes freeze out in Central Texas, however, and the stand the following year will be poor. There are two kinds of bur clover: the Southern spotted and the California. Both kinds are found here, but the Southern spotted is more common and is perhaps more hardy than the California.

If seed is in the Bur it need not be inoculated. If the Soil Erosion Service furnishes you with hulled seed you will be given inoculating material also.

Bur Clover should be sown from August to October.

Sow one to two bushels of Bur Clover per acre; or 5 to 10 lbs. of hulled seed.

Bur Clover will reseed itself under grazing conditions.

Black Medic

Black Medic is a winter legume and will furnish winter and spring grazing similar to Bur Clover, but will last longer in the spring than Bur Clover. It is better adapted for sheep than Bur Clover because it does not

have the objectionable bur that sticks to the wool. Black Medic is not common in Central Texas but we believe it merits a thorough trial.

The seed should be inoculated.

Read carefully the instructions on the inoculant container.

Sow seed from September to February--the earlier the better, however.

Sow 10 pounds when no other clover is planted; or 5 pounds per acre when Bur Clover is to be sowed also.

Black Medic will reseed itself under grazing conditions.

Rescue

Rescue should be in every permanent pasture to furnish winter grazing. It will stay green during severe winters and dies down about May.

Rescue is a non-legume - no inoculation is necessary.

Sow seed from September to November.

The Soil Erosion Service sowed seed last January and got fair results, but it should be sowed in early fall.

Sow 10 pounds per acre when Rye or Bur Clover or Black Medic is not being planted also. Five pounds is sufficient when other winter grasses are being planted.

Rescue will reseed itself under grazing conditions.

Italian Rye

This grass makes excellent winter grazing from midwinter to June. It will stand severe winters. It is an annual and will not reseed itself if heavily grazed in May and June. Some farmers take stock off in May and June in order to allow Rye to reseed. The seed are cheap, however, and it is questionable under some conditions whether it is better to take stock off or to buy seed and replant each year.

Rye is a non-legume - no inoculation is necessary.

Sow seed from September to November.

Sow 5 pounds per acre when planted with Rescue, or 20 pounds per acre when sowing alone.

Rye will not reseed if grazed heavily in May and June.

SUMMER GRASSES

Bermuda

Bermuda is the best known of all summer grasses for permanent pasture. It is adapted to all types of soils but will not do well on poor, sandy soils or water-logged soils. It cannot be beaten as a grass for stopping erosion, and under normal conditions will furnish grazing all summer.

Bermuda is not a legume.

We recommend sodding instead of seeding this grass. The germination percentage of the seed is low and it is usually hard to get a stand.

A good method of starting Bermuda is to open furrows about three feet apart on the contour with a breaking plow and drop pieces of sod in the furrows. They can be covered with a plow. Sod should be set in February and March.

Dallis Grass

Dallis grass, we believe, is one of the best all round grasses for permanent pasture. It comes out earlier in the spring and will remain longer in the summer than Bermuda. Under normal rainfall conditions it will remain green up until late fall. The grass grows slowly in cold weather, but as soon as a few mild days follow, new shoots will come out. The grass seems to be better adapted to moist heavy land and many times is difficult to get started. If planted on sloping ground the land should first be contoured to hold water on the land, and the seed planted in the contour furrow, preferably with manure.

Dallis Grass is not a legume - no inoculation is necessary.

Sow in February or March.

Sow 10 pounds per acre when no other summer grass is on the land, or 5 pounds per acre when planted with Bermuda or Buffalo grass.

Dallis grass is a perennial and will do well under grazing conditions.

Buffalo Grass

Buffalo grass is a native of this section and is an excellent summer grass, but will not control erosion as well as Bermuda. It does not spread as rapidly as Bermuda, and is more easily controlled if it gets started in the cultivated field. Buffalo is commonly called Mesquite, although it is not one of the mesquite grasses. Buffalo or Bermuda should be the basic grass in your pasture.

Buffalo is not a legume.

Seed cannot be purchased, and so sodding is necessary to get it started. We recommend sodding the same as Bermuda, in February and March.

Buffalo will reseed under grazing.

BRAZOS RIVER WATERSHED DEVELOPMENT

A bill is to be submitted to the next session of Congress to provide a loan for the construction of some 12 major dams and perhaps some additional smaller dams on the Brazos River and its principal tributaries. These structures would be for the purpose of impounding flood waters, thus checking disastrous floods and furnishing water for power, irrigation, use of municipalities, etc.

Several of the agricultural leaders of the state have for years been emphasizing the importance of including in this program a provision for the control of soil erosion throughout the entire watershed. Such a program would hold considerably more of the rainfall on the land, thus very materially assisting in preventing floods. It would also greatly lengthen the life of the reservoirs and the usefulness of the dams by minimizing the silting of the reservoirs.

The greatest benefit, however, to be derived from the erosion control part of the program, would be the conservation of soil and water on the farm lands of the watershed. The soils have been washing away at an alarming rate, and it becoming more and more difficult to eke out more than a mere living on the greater part of the land. If something is not done in the near future to check this unnecessary wastage of our greatest national asset, the future of those dependent on the land for a living will be dismal indeed.

Some facts concerning the Brazos Watershed and the proposed program are given below:

Organized by act Forty-first Legislature, Second Called Session.

Purely Public Project, not operated for profit of any individual.

Embraces whole of watershed of Brazos River and its tributaries.

Comprises one sixth of area of State, approximately twenty-eight million acres.

Contains approximately twenty-seven per cent of population of State.

Has approximately 750 million dollars assessed values.

Is traversed by about 3500 miles of main line railroads, and by many hundreds of miles of State and Federal highways.

Contains 39 cities having population of 2,000 or more; of these cities 17 have more than 5,000, and 7 more than 10,000 population.

The United States Weather Bureau has estimated the total property and business loss from floods, period 1913-1929, in excess of $29,000,000. (Twenty-nine Million Dollars), or an average loss of nearly $2,000,000 per year; loss of life 346 (Page 2, Doc. 181, 72nd Congress, 2nd Session); there is an unestimated loss from drouths that will probably exceed the loss from floods.

Plans are not yet complete but, based on data secured by the surveys made under appropriations 1923-25, Board of Water Engineers has been enabled to outline a series of dams, as follows:

NO.	COUNTY	NAME OF RIVER	SPILLWAY ELEVATION	HEIGHT FEET	RESERVOIR AREA, ACRES	STORAGE ACRE-FEET
1	Shackelford) Throckmorton)	Clear Fork	1350	115	12,900	460,000
2	Stonewall) Haskell)	Salt Fork	1531	61	12,000	300,000
3	Palo Pinto	Brazos	1000	125	21,300	757,000
3-A	Palo Pinto	Brazos	875	45	2,100	30,000
4	Palo Pinto	Brazos	830	90	10,800	300,000
5	Hood	Brazos	690	85	7,300	127,000
6	Somervell) Johnson	Brazos	600	100	10,500	230,000
7	McLennan	Bosque		50	1,850	30,000
8	Bell	Leon	585	115	10,300	340,000
9	Bell	Little River	475	60	5,750	80,000
10	Bell	Lampasas	605	115	5,000	160,000
11	Williamson	San Gabriel	760	110	5,600	220,000
12	Brazos Madison	Navasota	290	40	18,000	318,000
		TOTAL		1111	133,400	3,342,000

It is estimated that these dams will have a storage capacity of approximately three and one half million acre feet of water, and will give virtual control of the major floods of the Brazos.

The stored waters will be under the control of the Public District and may be used for any beneficial purpose that may be deemed by the Directors of the District to be for the best interests of the public.

It is estimated:

(1) That between one million and three million acres of valuable land may be protected from overflow.

(2) That more than a half million acres may be irrigated.

(3) That between two hundred and fifty and three hundred million kilowatt hours of electrical energy may be generated annually.

(4) That sufficient water for all domestic, municipal and industrial purposes that might be required, will be made available.

(5) That the numerous reservoirs will put within easy reach of all the residents of the district and adjoining areas, recreation centers of great attractiveness.

It is proposed to locate and incorporate in the complete plan of improvement, other smaller dams and reservoirs, principally on the upper reaches of the tributaries of the Brazos, and do such other things as may be needed to provide protection to the lands and property within the watershed.

It has been estimated that the cost of the entire program as outlined, but not including a specific allotment for erosion control, would approximate fifty million dollars.

It is planned to ask Congress for a loan to put this program into effect. The project would be self-liquidating, the sale of water, power rights, etc., being estimated as adequate to retire the total indebtedness.

Suggested Erosion Control Program

It has been urged that a definite allotment be made in the bill to provide specifically for soil erosion control. It was proposed that the allotment for construction of dams, and for similar works, be set at forty-five million dollars, and that erosion control be allotted fifteen million dollars. This would increase the total loan to sixty million dollars.

It is believed that a complete development of the erosion control program would at least double the effective life of the reservoirs by minimizing silting, and thus add tremendously to their usefulness and revenue producing power.

It would cause more water to penetrate into the soil, thus helping materially to overcome the harmful effects of droughts.

It would check the disastrous erosion which is washing away the fertile topsoil of the watershed and is bringing poverty to thousands upon thousands of farms, and would pave the way for the restoration of agricultural prosperity in the watershed.

The combined program would be directly in line with the president's policy of conservation and development of natural resources.

It would extend to every farmer in the watershed the opportunity to share in the direct benefits of the program.

The magnitude of the program will be realized by a consideration of the following facts:

There are between eight and ten million acres of cultivated land in the watershed. At least 20% of this is already gullied, and a total of more than 85% would be benefited by a complete erosion control program.

There are over four million acres of gullied pasture lands, and this amound will rapidly increase unless means are taken to check this advance of the gullies.

Complete Program Necessary

It is felt that a program of erosion control which embodies terracing alone is not sufficient to meet the requirements of the watershed. It has been

proven that under certain conditions terraced land loses even more soil and water than land that is not terraced. Ordinarily the reverse is true, but the proper program should be one that includes all factors, such as differences in soil, slope, cropping systems, rainfall intensities, etc. Vegetation is nature's means of preventing erosion and is the most complete protection yet discovered. Any program which ignores this basic fact falls short of its greatest possibilites. A complete program should combine agronomic, forestry and engineering methods of erosion control. When this is done, the program also becomes one of proper land utilization. This type of project is needed throughout the Brazos Watershed to supplement and strengthen the hydro-electric development program.

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B A N Q U E T A N N O U N C E M E N T

On Thursday night, December 20th, at seven o'clock, the Temple Board of Development is sponsoring a banqyet honoring the Board of Directors of the Brazos River Conservation and Reclamation District.

There will be a discussion of the project by Mr. L. Mims, President of the Board, and Mr. John A. Norris, Chairman of the State Board of Water Engineers, so that everyone interested will have an opportunity to become familiar with the details of the program. It is planned to have short talks by Senator Tom Connally, Governor-Elect James V. Allred, Dr. T. O. Walton, President of Texas A. & M. College, Mr. A. B. Conner, Director of the Texas Agricultural Experiment Station, and Mr. O. B. Martin, Director of Agricultural Extension Work, Texas A. & M. College.

The banquet will be held on the roof of the Doering Hotel, and reservations should be made not later than Tuesday night, Dec. 18, with Walter Humphrey, Editor of the Temple Daily Telegram. The tickets are seventy-five cents.

It is urged that everyone interested in the project make a special effort to attend this banquet.

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CANCER CURE FOUND

National Scientific Organizations Recommend Diversified Treatment

If a doctor were to announce that he would treat all types of cancerous growths in exactly the same manner, regardless of their type, location, stage of development, etc., we would question the soundness of his judgment.

Erosion is a land cancer which, if not checked in its early stage, rapidly spreads, eating away the healthy tissue - - the fertile topsoil - - gradually weakening the production capacity, and finally causing complete destruction. As in the human body, the first stages of the ailment often go unnoticed, and it is not until a malignant condition exists that proper attention is given.

Human cancer is sometimes attributed to external irritation, although unhealthy body conditions may be a contributing cause. Land cancer is likewise brought about by an external influence - the flowing of rainfall over the surface. Internal conditions, however, are very important, although seldom given consideration. If land is healthy, rich in humus, and is tightly bound together by fibrous plant roots, erosion will proceed much more slowly.

The best time to fight erosion is while the soil is still healthy. Means should be taken to remove the cause before the destructive stage is reached.

Similar to the treatment of any disease, a careful study is necessary to determine what method or combination of methods will be most successful in combating erosion on any particular area. Each farm deserves a special study in order to adapt the control methods to the conditions existing on that particular piece of land. No two farms are exactly alike, and it is not possible to determine the best means of approach unless attention is given to all phases of the problem.

No one method of erosion control will fit all conditions. If a complete cure is to be effected, it will be necessary to utilize all practical measures that are adaptable and that have demonstrated their usefulness.

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On the following pages are resolutions adopted by two of the leading national scientific agricultural organizations. They show conclusively that it is becoming generally recognized that if we hope for anything like a complete control of erosion, we must adopt a complete, well-rounded program, employing a wide range of methods, as the particular conditions demand.

VEGETATIVE MEANS OF EROSION CONTROL ENDORSED BY NATIONAL ASSEMBLY

RESOLUTION ADOPTED BY THE AMERICAN SOCIETY OF AGRONOMY, AT ITS ANNUAL MEETING, NOVEMBER 22, 1934.

As the results of experiments in soil conservation and erosion control show definitely that methods of soil management and cropping methods are very important in conserving soil and controlling run-off water, and as there has been, and is now, a tendency by certain ones to consider terracing as the most important implement of erosion control,

BE IT RESOLVED BY THIS SOCIETY that, any National or State program of erosion control and soil conservation should include all of the methods of attack which are proven to be valuable by carefully conducted experiments. A complete program of erosion control must include vegetative methods using grass and trees, contour farming and strip cropping, and crop rotations with soil erosion resisting crops in the rotation and in strips on the contour.

BE IT FURTHER RESOLVED that no terracing should be promoted in any soil conservation program by our national Government unless they are properly combined with sensible soil management and agronomic methods of erosion control based upon a soil classification and study that will provide the necessary knowledge regarding the several factors which must be considered for the best utilization of each field, considering soil type, slope of the land, type and extent of erosion, and the present use that is being made of the field.

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The Soil Erosion Service agrees heartily with this Resolution. On all of its projects it is endeavoring to put into effect as complete a program of erosion control as is practicable under the local conditions. It is using vegetative means of control where possible; retiring steep, erosive land from cultivation, converting such areas to permanent pasture or forest land; developing a better balanced crop rotation system, designed to give greater erosion protection and provide more of the farm products which heretofore have had to be purchased.

RESOLUTION ON EROSION CONTROL PROGRAM

THE FOLLOWING RESOLUTION WAS ADOPTED BY THE AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS AT THEIR MEETING IN CHICAGO, DECEMBER 1, 1934.

WHEREAS the emergency agencies, Emergency Conservation Work and Soil Erosion Service, now actively engaged in projects of soil erosion control are emphasizing the need and value of conserving our nation's greatest natural resource, our agricultural soils, by a program including the agronomic, forestry and engineering phases of erosion control correlated with good farm management; *

AND WHEREAS the Emergency Conservation Work and the Soil Erosion Service are accomplishing valuable demonstrational and educational work;

AND WHEREAS the programs of these organizations are based on the research educational and extension experience and programs of the U.S. Department of Agriculture, and the State Agricultural Colleges;

AND WHEREAS the established agency of the Agricultural Extension Program is organized to extend the educational benefit to all farmers in all counties of the United States in conformity with the recommendations of the United States Department of Agriculture and the State Agricultural Colleges;

AND WHEREAS the demonstrations may be made a valuable part of a continued erosion control program;

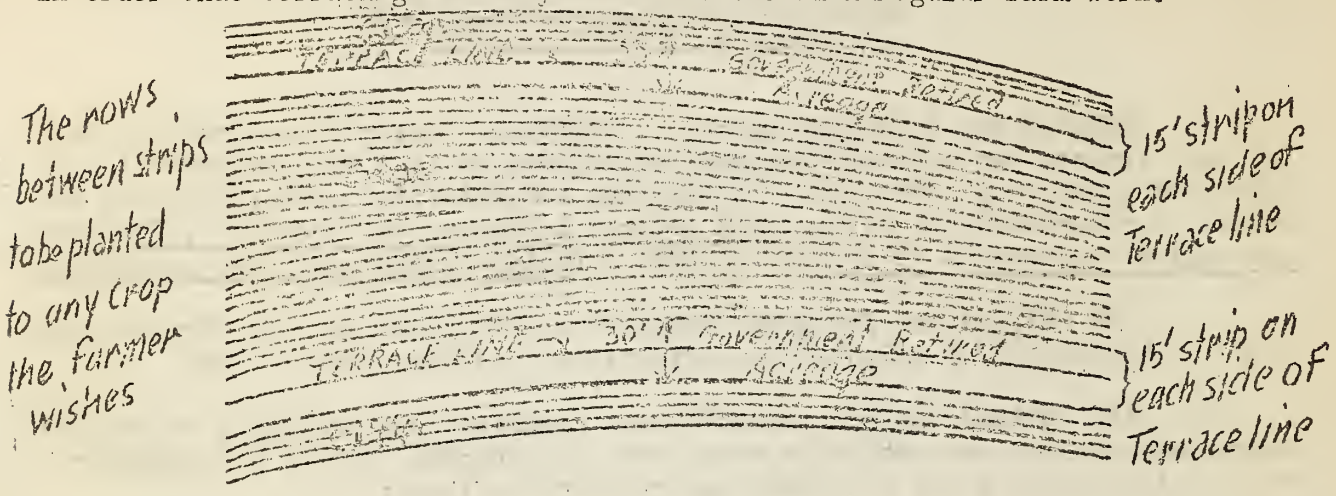
BE IS RESOLVED, That the present emergency organizations carry on their work through the period of emergency and that provisions be made for the established Federal and State Agricultural agencies to continue the work on a scale commensurate with its importance until an effective control of erosion is consummated.

(* underscoring is ours.)

The Soil Erosion Service appreciates this complimentary expression from the Agricultural Engineers, and wishes to emphasize its desire to conduct its activities in such a way that it will not only accomplish a much needed work, but will at the same time assist to as great an extent as possible in the relief of unemployment.

LAYING OFF ROWS PARALLEL TO TERRACE LINES BEFORE TERRACES ARE CONSTRUCTED

No doubt many farmers will not have time to construct their terraces before time to prepare their land for another crop. The Soil Erosion Service advises, therefore, that the plan suggested in the following diagram be followed in order that terracing work may not interfere with regular farm work.



Place a stake 15 feet below and 15 feet above each stake representing the center of the terrace. These stakes will be the boundary of a thirty foot strip, which should be enough space to construct a standard terrace. Rows should be run parallel to the terraces with the point rows in the center.

Advantages

1. Prevents loss of terrace lines.
2. Enables farmer to do regular farm work and construct terraces after land is put up.
3. The terrace strip can be counted as Government retired acreage.
4. If weather conditions do not permit construction of terraces in winter, the strips can be planted in sorghums or sudan, and, after harvest, the terraces constructed in the summer.
5. The contoured rows running parallel with the terrace will help prevent washing until the terraces can be constructed.

The Soil Erosion Service insists, however, that the farmer construct terraces as soon as possible, as no one knows how much longer the Government will continue to help farmers construct terraces. A great many farmers carried out this suggestion last winter and constructed terraces in the summer while cotton was on the land.

The Soil Erosion Service will furnish lengths of all terraces, which will enable the farmer to figure the area in the strips.

SOIL AND WATER LOSSES FROM EXPERIMENT PLOTS 1, 2 and 3.

The Soil Erosion Service has set up three experimental plots to determine soil and water losses from pastures and cultivated fields.

The three plots installed include a cultivated field on which erosion is not controlled, a pasture plot grazed according to general farm practice (overgrazing usually occurring), and a pasture plot on which grazing is regulated.

The plots are located on farms in the Elm Creek Watershed where they can be observed by farmers and others interested in soil and water losses.

Plot No. One - 1/15 Acre

Plot No. 1 is located on the T.B. Lewis farm about 5½ miles South of Moody and is a part of a four acre pasture on which grazing is not controlled. The average slope on the plot is 15%. Four head of work stock and three cows have access to the pasture. The area was sodded to Bermuda in three foot rows in February, 1934, and was seeded to Rescue and Italian grasses in January, 1934. Due to the six month's drought from April to November the Bermuda has spread very little, and the rescue, being planted so late, did not produce much seed.

The plot of approximately 1/15 acre is surrounded by a small earth ridge to that the soil and water runoff can be collected and measured. The livestock are allowed to graze on the plot the same as on the remainder of the pasture.

From three rains which occurred November 15, 19, and 20, 1934, 2385.52 pounds of dry soil was lost. In other words, 18.7 tons of dry soil were lost per acre. The total rainfall for this period was 6 inches. Of this amount 55.5% was lost as surface runoff. This means that over half, or approximately 91,000 gallons of rainwater was lost from each acre of the pasture.

Plot No. Two - 1/20 Acre

This plot is located on the same pasture as Plot No. 1. It represents approximately 1/20 acre, and is surrounded by a fence so that grazing can be regulated.

The plot was in the same condition, so far as vegetation is concerned, as the remainder of the pasture, and its water and soil losses were approximately the same as on Plot No. 1. As the grass becomes established, however, the soil and water losses will diminish. Since the plot is fenced off from the remainder of the pasture grazing can be controlled and the grass should become well established, under normal conditions, within a year's time. The object of this experiment is to determine to what extent a good grass cover will check runoff and erosion.

Plot No. Three - 8 Acres.

This plot is located on the W.O. Johnson farm three miles south of Moody. The plot is an 8 acre cultivated field with a slope ranging from 0 to 5%.

The field has no erosion control and is cultivated according to practices of the average farmer of this section. Oats were drilled in the first part of October, and at the time of the rain were about three inches high.

From the three rains which occurred November 15, 19 and 20, 1934, 65,050 pounds of dry soil, or 32.52 tons, were lost from the 8 acre field. This means that 4 tons of the topsoil were lost per acre. The total rainfall on this plot was 5.22 inches. The total water loss on this field could not be accurately calculated, as the arrangement for measuring the water had not been completed at that time.

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"The public has a paramount interest in soil conservation.

The right of future generations to a soil that will provide them with sufficient food is superior to the right of a present owner to ruin that soil by careless handling."

Clifford V. Gregory -- in the Prairie Farmer

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A man from Mars alighted in America, intending to remain if he liked the country, and engaged an experienced booster to serve as guide.

As the two drove across country, the Martian observed the strange color of creeks and rivers and asked what made the water so dark.

"That," said the booster, "Is mud made of topsoil. Most of our land is sloping and the usual method of cultivation encourages washing. In a few years our soil will be gone."

"But why is it permitted?", asked the Martian.

"Oh," said the booster, "this is a free country and a man can do as he pleases with his own property."

Robert Quillen -- in the Atlanta Constitution.

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Mr. Frank Lynch on the W.F. Hill place near Moody said that before 1934 his well used to go dry almost every year. Last year the farm above him was contoured and terraced. Mr. Lynch states this year his well had plenty of water during the driest part of the summer, and that his surface tank caught hardly any water from the farm above.

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PROGRESS REPORT AS OF NOVEMBER 30, 1934.

1. 1,592,727 feet of terrace lines were run during the month of November. Total feet of terrace lines run up to November 30th, 8,666,907.

2. 652,689 feet of terraces were constructed during month of November. Total feet of terraces constructed up to November 30th, 3,656,814.

3. 211 permanent or temporary dams and spillways were constructed for gully control and terrace outlet protection during the month of November. 1,871 dams of all types have been built to November 30th. 500 E.C.W. men from the Temple Camp, S.E.S. T-1 and the Troy Camp, S.E.S. T-2 are used in the construction of these dams.

4. Economic surveys on 90 farms were made during November. Economic surveys on 245 farms have been completed to November 30th.

5. 78 terrace outlets were seeded or sodded during November.

6. 699 acres of eroded land have been retired from cultivation and converted into permanent pasture.

7. Farmers have agreed to contour furrow 955 acres of pasture land, and 391 acres have been contour furrowed.

8. Soil erosion control practices have either been completed or are under process of completion on 385 farms.

9. One ditch was sodded during the month of November.

10. On 371 farms, comprising 44,616 acres, terrace lines have been run or constructed on 38,423 acres. This means that of the total acreage of 371 farms, at least 86% need protection.

11. 181 government terracing graders,
90 government-owned fresnoes,
10 farmer-owned terracing graders and
9 large type road graders from Bell, Milam and Falls counties are being used in the construction of terraces, and work is being done on 385 farms.

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If the terrace lines run on the Elm Creek Watershed up to November 30 were constructed into one long terrace running West from Temple through Los Angeles, California, it would extend 200 miles into the Pacific Ocean.

On To Hawaii, 1900 Miles More!

RAINFALL IN THE BIG ELM AND NORTH ELM AREA DURING NOVEMBER, 1934.

Sta. No.	At or Near	Rainfall	Observer
11	Stringtown	8.52 in.	C.M. Dyess
12	Heidenheimer	no record	
13	Oscar	7.96 in.	Frank Mares
14	Doubleheader	5.30 in.	Leo Sana
15	N.W. of Temple	6.85 in.	J.W. Kelley
16	Troy	9.95 in.	Wm. Brown
17	Pendleton	4.50 in.	Wm. Phillips
18	Moody	2.70 in.(prob. more)	R.I. Melton
19	Shiloh Church	10.99 in.	V.A. Spohn
20	Bottoms Store	11.25 in.	C.H. Beckerman
21	Conaville	7.44 in.	H.P. Linn
22	Theo Church	7.87 in.	T.A. Earnhardt
23	Bean Hill	7.81 in.	Thos. B.R. Gwin
24	Seaton	7.78 in.	Frank Macek
25	Airville	8.11 in.	Jerry Beran
26	Cyclone	6.22 in.	Robt. Hoelscher
27	Meeks	6.94 in.	F.J. Bedrick
40	Yarrellton	4.08 in.	I.M. Wilkerson
43	Barclay	7.51 in.	Earnest Dickman
44	Terry Chapel	7.93 in.	A.E. Pagel
45	Burlington	5.80 in.	W.E. McAtee
46	Meeks	4.39 in.	F.A. Cochran
47	Westphalia	4.97 in.	Geo. Ranley

Note: Stations Nos. 40-47 are in the North Elm area.

SOILS

General Terms

Soil

The soil is a natural body occupying the surface portion of the Earth, composed of mineral and organic materials and having more or less definitely developed horizons of eluviation and illuviation.

Profile - Soil Profile

A soil profile is a vertical section of the soil from the surface into the underlying unweathered material.

Stratum - Strata

A layer or layers of material whose character was established during formation and is not due to subsequent alteration by weathering.

Horizon - Soil Horizon

A layer or portion of the soil profile, more or less well defined, and occupying a position approximately parallel to the soil surface.

Horizon A

The upper portion of the soil mass, from which material has been removed by percolating waters. The eluviated horizons of the solum. The 'Surface' soil.

Horizon B

The horizon of deposition, to which materials have been added by percolating waters. The illuviated horizons of the solum. The 'Subsoil'.

Horizon C

The horizon of relatively unweathered material underlying the B horizon. (The 'substratum')

The C horizon, while often described as "unweathered", usually shows some modification in the upper portions and may have one or more sub-horizons. In most cases it represents the "parent material" similar to that from which the soil was formed.

Solum

The weathered portion of the soil mass. The A and B horizons.

Parent Material

The slightly altered or wholly unweathered material beneath the solum, similar to that from which the soil was formed. The C horizons. (See discussion under definition of "C Horizons".)

Eluviation - Eluvial

A process of removal by percolating waters of material in solution or in suspension. Horizons from which material has been removed by eluviation.

Illuviation - Illuvial

A process of accumulation by deposition from percolating waters of material transported in solution or suspension. Horizons in which material has been deposited by illuviation.

Soil Characteristics

Qualities, properties or features that may serve to establish the character os a soil.

Residual Soil

Sedentary soils formed by the weathering of mineral material; by the disintegration and decomposition of rocks in place.

Alluvial Soil

Soil formed from materials transported by flowing waters and deposited as alluvial fans and flood plains.

Organic Matter (of the Soil)

The more or less decomposed material of the soil derived from organic sources, usually from plant remains.

Humus

A more or less stable stage in the decomposition of organic matter in the soil.

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GEORGE WASHINGTON REALIZED THE RAVAGES OF EROSION

George Washington may not have been the first to practice erosion control, but he was among the first in America to acknowledge the ravages of erosion and to attempt to maintain his rich farm lands in their fertile state.

His foresight as a scientific farmer is evidenced by letters on display in the Library of Congress.

On December 10th, 1799, four days before his death, the first President wrote final instructions to his farm overseer, Mr. Anderson, listing erosion control as a major item in the plan of operations.

Washington had three farms, the "Muddy Hole Farm", the "River Farm" and the "Union Farm", and on each soil losses presented a problem. To Anderson he wrote, concerning his Muddy Hole farm:

"The washed and gullied parts of it ought to be levelled and smoothed, and as far as it can be accomplished, covered with litter, straw, weeds, corn stalks, or any other kind of vegitable rubbish, to bind together, and to prevent the earth from gullying."

Not only did Washington realize the necessity of keeping a cover of vegetation -- he termed it "vegitable rubbish" -- on the ground, but he practiced crop rotation and other methods of sound land use, such as keeping eroded lands out of cultivation. The latter practice, along with crop rotation, is among the methods now being advanced by the Soil Erosion Service in thirth watershed demonstration areas over the country.

Similar instructions were outlined by Mr. Washington for his River farm. Referring to Field No. 1, he directed:

"..... part is in meadow, and will remain so, and the most broken,

washed and indifferent parts of it to remain uncultivated, but to be harrowed and smoothed in the spring, and the worst parts thereof (if practicable) be covered with litter, straw, weeds, or any kind of vegitable rubbish to prevent them from running into gullies."

Field No. 2 on his Union Farm, an "indifferent field, washed in some places, gullied in others, and rich in none", was to be "prevented from getting worse, and becoming such eye sores as they now are."

Washington's erosion control measures, while not exactly in line with the most modern methods developed and urged by the Soil Erosion Service, were fundamentally correct, according to H.H. Bennett, Director of the Service. The importance of maintaining a vegetative cover on eroding lands, he pointed out, is one of the salient points in the nation-wide erosion control program now under way.

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QUESTIONS AND ANSWERS

Question:

Can the farmer plant anything he wants to on terrace ridges or must crops be kept off the terraces?

Mat Bosl - Temple

Answer:

The Soil Erosion Service suggests and recommends that terraces be sowed to a close planted crop the first year. It is better that the terraces be sowed than remain idle. Oats, rye, cane, sudan, hairy vetch, etc. are good crops to plant on the terraces. Row crops such as cotton and corn should not be planted on the terraces the first year.

Question:

Will you please send me 80 pounds of Hubam Clover seed?

M.C. Blount, Atlanta, Texas.

Answer:

Seed distributed by the Soil Erosion Service can not be given to farmers outside of the Elm Creek Watershed. Mr. Blount is therefore not eligible to receive Hubam Seed. No work of any kind is being done by this project on any farms not in the Elm Creek Watershed.

Question:

When will farmers who have been promised fencing material receive it?

W.E. Lesikar, Rogers

Answer:

As soon as the material is received, it will be delivered to the farms.

UNITED STATES
DEPARTMENT OF THE INTERIOR
SOIL EROSION SERVICE
TEMPLE, TEXAS

OFFICIAL BUSINESS

SOIL EROSION SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR
ELM CREEK WATERSHED--CENTRAL TEXAS
NEWS LETTER---------NO. 7
TEMPLE, TEXAS. DECEMBER, 1934.